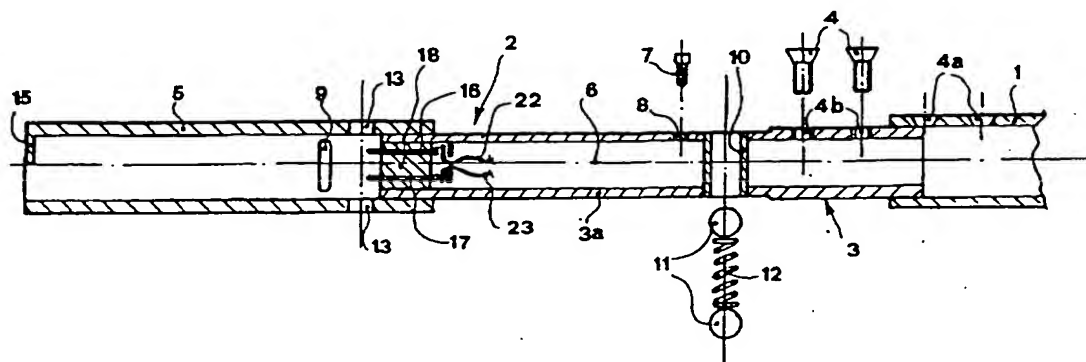




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(21) International Application Number: PCT/IT97/00028 (22) International Filing Date: 7 February 1997 (07.02.97) (30) Priority Data: FI96A000022 9 February 1996 (09.02.96) IT (71)(72) Applicants and Inventors: GIUNCHI, Marco [IT/TT]; Via Berlicche, 32, I-51037 Agliana (IT). CALZOLANI, Marco [IT/IT]; Via Pacini, 38, I-50100 Firenze (IT). (74) Agents: BARDINI, Marco, Luigi et al.; Società Italiana Brevetti S.p.A., Corso dei Tintori, 25, I-50122 Firenze (IT).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report.

(54) Title: HANDLE GRIP DEVICE FOR OPERATING CONTROLS ON VEHICLES

**(57) Abstract**

A device for operating controls on a vehicle, such as a motorcycle or a car, that at the same time allows the driver to securely maintain the control of the steering with both hands. The device (2) comprises a handle grip (5) having driving functionality, pivotally connected to a portion (1) of the vehicle steering, and able to be placed in a first and a second operative position with respect to the steering gear to which a first and a second electric control correspond. The handle grip includes internally an electrode (15) electrically connected with the vehicle's electric ground (14), in the first contact (16) corresponding to the first control and, respectively, with a second contact (17) corresponding to the second control. The handle grip (5) can assume either a stable position, where no electric contact is made or else one of two angularly spaced positions, either of an impulsive type with elastic return or of a stable type, in which, by means of an electric circuit (20), various driving functions, such as starting, horn, headlight controls, etc., are made to correspond.

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HANDLE GRIP DEVICE FOR OPERATING CONTROLS ON VEHICLES
DESCRIPTION

Field of the invention.

5 The present invention relates to the motorcycle and car fields, and more precisely it refers to a handle grip device for operating controls on a vehicle, such as a motorbike, a car, and so on.

10 Description of the prior art

Motorcycle drivers can operate controls on their vehicle in different ways, including: acting on the right handle grip to give gas to the motor, acting on various push buttons located on the handlebar to switch on the
15 headlights, the turn signals or the horn, pulling on the levers for the brakes and the clutch, acting on pedals to switch gears, and rotating the starting key to start the motor.

Acting on the push buttons located on the handlebar
20 has the inconvenience of causing, for a few seconds, conditions that are unsafe for driving. In fact, during those few seconds the driver has to search - usually with his left hand - for the control, normally a button or a switch. In this situation the driver's left hand presses
25 only lightly on the handlebar or even detaches completely from the handlebar itself with the result that the vehicle is controlled only with the right hand. Even if in most cases this situation does not cause any particular problems, since driving only with the right hand is
30 sufficient to ensure the stability of the motorbike while the left hand acts on the buttons, it must be underlined that according to the law it is dangerous to drive with just one hand.

Moreover, for example, night driving requires the

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headlights to be switched frequently from high beams to normal, whenever another vehicle passes by, and when the switching is executed during a curve a dangerous situation may occur. The same thing happens when the driver must suddenly honk to avoid a hazard or when the turn signal has to be switched on for a sudden change of direction while driving in traffic.

For all these reasons, many motorcyclists try to use these controls as little as possible, especially when wearing gloves, because they prefer not to limit their control on the vehicle. This choice implies a compromise that induces an incorrect approach to road driving, which instead requires the best attention and discipline in using the appropriate signals. In fact, it may happen that the motorcyclist is tempted not to switch on the headlights when entering a tunnel, since they often can be switched on only by turning a key located on the frame under the handlebar, or not to switch off the high beams when meeting another vehicle by night.

A similar situation, but less dangerous, can occur when driving a car, where in order to turn on the headlights or to honk it is often necessary to drive for a few seconds with just one hand.

Summary of the invention

It is therefore the purpose of the present invention to provide a device to execute controls on a vehicle, such as a motorbike or a car, that allows the driver to securely maintain control of the steering with both hands.

This purpose is achieved by the device according to this invention, whose feature is to include a handle grip pivotally connected to a portion of the steering gear, said handle grip having driving functionality and being able to be placed in a first and a second operative

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position with respect to the steering gear to which a first and a second electric control correspond.

The handle grip includes internally an electrode electrically connected with the vehicle's electric ground, the electrode coming electrically in touch, in the first and second position respectively, with a first contact corresponding to the first control and with a second contact corresponding to the second control.

The handle grip can assume either a stable position, where no electric contact is made, or else one of two angularly spaced positions, either of an impulsive type with elastic return or of a stable type, in which correspond to the first and second control one or more different functions activated by means of an electric circuit, including: starting, horn, switch between high and normal beams and viceversa for the headlights, control for flashing with the high or with the normal beams, turn signal for either direction.

Brief description of the drawings

The invention will be illustrated in the following description of possible embodiments, which are to be intended only as examples and not a limitation, with reference to the attached drawings, in which:

- Fig. 1 is a partially exploded, cross sectional view of a device according to the present invention for executing controls applied to a motorcycle handlebar;

- Fig. is a cross sectional view of a different embodiment of the device of Fig. 1;

- Fig. 3 is a cross section according to the arrows III-III of the device of Fig. 2;

- Fig. 4 is a cross section according to the arrows IV-IV of the device of Fig. 2;

- Fig. 5 shows a possible electrical scheme for the

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control circuit associated with the device of Fig. 1;

- Fig. 6 shows a different version of the scheme of Fig. 5;

- Fig. 7 shows a different version of the device of Fig. 1 applied to a steering wheel;

- Fig. 8,9 and 10 are an exploded longitudinal view and transverse cross sectional views of a third embodiment of the device of Figs. 1 to 4.

10 Description of a preferred embodiment

Referring to Fig. 1, a device 2 according to the present invention is applied to a tubular end 1 of the steering handlebar of a motorcycle, for example the left end, and includes a tubular extension 3, fitted for being
15 attached to end 1 of the handlebar by means of screws 4 through holes 4a and 4b, and on a portion 3a of which, of a slightly smaller diameter, a tubular handle grip 5 is engaged. The latter is free to rotate around axis 6 of end 1 and of extension 3, but this movement is limited between
20 two stop positions determined by a screw 7 engaged with a hole 8 formed in extension 3 and with a slot 9 made in grip 5. Extension 3 has a transverse cylindrical seat 10 throughout it, containing a pair of spheres 11 at the end of a spring 12 and fitted for engaging with holes 13
25 formed in grip 5 in order to establish an intermediate stop position for the grip itself among the various rotating positions with respect to extension 3.

As shown in Fig. 2, according to a variation of the invention, handle grip 5 can engage directly with end 1 of
30 the handlebar, slot 9 and transverse seat 10 containing spheres 11 having previously formed on the grip and on the handlebar.

According to the invention, as shown in Figs. 1 to 4, grip 5 has an electrode 15 projecting internally and

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situated between a first contact 16 and a second contact 17 integral to an insulated plug 18 fitted in extension 3 (Fig. 1) or in handlebar end 1 (Fig. 2). Contacts 16 and 17 are electrically connected with a control circuit 20 that will be described in the following.

The motorcyclist, driving with hands on both the right and left grip, can, without detaching his hands from the handlebar, rotate grip 5, starting from the central position on Figs. 1 to 4, and bring electrode 15 in touch with first contact 16 by rotating in one direction or with second contact 17 by rotating in the opposite direction. When electrode 15 comes in touch with one of the two contacts 16 or 17, it connects that contact with the vehicle's electric ground since handle 1 is in contact with the entire handlebar, and thus with the frame.

Electrodes 16 and 17 are also connected by means of electrical wires 22 and 23 to some controls or to the devices acting on those controls of the vehicle.

According to a first embodiment, very primitive and therefore not shown, wire 22 is connected to a relay that, when the headlights are on, allows switching from normal to high beams. The signal carried by wire 22 is of an impulsive type, that is, a current impulse from the above-mentioned relay to the vehicle's electrical ground 14 through contact 16 and electrode 15. In the same way, wire 23 leaving contact 17 is connected to the horn of the motorcycle. Therefore, when the driver rotates grip 5 in one direction he brings electrode 15 in touch with contact 16, switching the headlights from high beams to normal or vice versa, while when he rotates the grip in the opposite direction electrode 15 touches contact 17, connecting the vehicle's electrical ground to the horn, so that it will honk as long as the grip is held in that position.

In this way the motorcyclist, in order to switch

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from normal to high beams, or to honk while driving, needs just to rotate grip 5 without removing the left hand away from the handlebar in order to operate the buttons or switches that, according to the prior art, controlled the horn or the passage between high and normal beams.

Referring now to Fig. 5, according to a preferred embodiment of the invention, wires 22 and 23 from contacts 16 and 17 are respectively connected to a six-way step by step relay 21 and to a relay 27. When the dashboard is on, the coil 21a of relay 21 is constantly under positive voltage 25 and its two inputs 21b and 21c are connected respectively to positive voltage 25 and the main switch for the vehicle headlights. Input 21b of relay 21 has a closed position "C" and an open position "O" connected to normal beams 26 of the headlights, while input 21c has a closed position C connected to high beams 28 of the headlights and an open position O.

The impulse given by electrode 15 when touching contact 16 produces a current through coil 21a that sets both inputs 21b and 21c to the N-O position. When main switch 24 is open, normal beams 26 are switched on, since they are under positive voltage 25. A further impulse given by electrode 15 touching again contact 16 brings inputs 21b and 21c back in position N-C, turning off normal beams 26. When the main switch 24 is closed instead, the impulses successively given by the driver by bringing electrode 15 repeatedly in touch with contact 16 through acting on grip 5, will cause the switching between normal beams 26 and high beams 28 and viceversa for the headlights. Therefore, depending if main switch 24 is open or closed, it will be possible for the driver respectively to turn on and off headlights 26 at normal beams (or high beams 28 if connected instead of normal beams 26) or to commute between high beams 28 and normal beams 26 or vice

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versa.

Still referring to Fig. 5, electric wire 23 is connected to input 27a of a three-way relay 27, whose open position O is connected to horn 29, while its closed position C is connected to coil 30a of a further three-way relay 30, that is normally already installed and connected to the starting motor in many types of motorbikes on the market. Coil 30a is maintained under positive voltage 31 together with input 30b, and the open position O of relay 30 is connected both to vehicle's starting motor 32 and to coil 33a of a further three-way relay 33 connected to ground 34 and whose input N is connected by means of a wire 33b to the negative pole of an alternator 35a via a voltage rectifier/stabilizer 35b. The output C of relay 33 is instead connected via coil 27b of relay 27 and a wire 33c, to the positive pole of alternator 35a via voltage rectifier/stabilizer 35b.

When the vehicle's motor is off, alternator 35a is also off and relay 27 is in the position N-C. An electric impulse given by bringing electrode 15 in touch with contact 17 causes relay 30 to switch from the position N-C to the position N-O, this way turning on starting motor 32. At the same time, the voltage produced by alternator 35a, rectified by 35b, causes relay 27 to switch to the position N-O. Furthermore, relay 30, which switched to position N-O when starting motor 32 was turned on, makes relay 33 switch to the position N-O. When the grip 5 is released, relays 30 and 33 go back to position N-C, while relay 27 stays in the position N-O as long as the motor of the vehicle is on. When the motor is on, therefore, any further impulse given by bringing electrode 15 in touch with contact 17 directly causes, via wire 23 and relay 27 in position N-O, horn 29 to honk. Relay 33 has only the function of preventing the voltage from alternator 35a,

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which is turning due to starting motor 32, from reaching relay 27, that otherwise would deactivate the starting motor independently of whether the starting occurred or not.

5 By means of circuit 20, described above and shown in Fig. 5, connected to contacts 16 and 17 of the device according to the present invention, the motor vehicle driver can:

- turn the motor on the first time that electrode 15 touches contact 17;

- honk with the horn 29 every successive time that he brings electrode 15 in touch with contact 17;

- turn on the headlight (normal beams), for example when entering a tunnel or to flash the lights during daytime, every time he brings electrode 15 in touch with contact 16 while switch 24 is open;

- switch from high beams 28 to normal beams 26 every time he brings electrode 15 in touch with contact 16 while switch 24 is closed.

20 Circuit 20, therefore, transforms two simple commands such as anti-clockwise and clockwise rotation of grip 5 so as to bring electrode 15 in touch with contacts 16 or 17 and vice versa, into a series of multiple functions, that can all be executed without any necessity of the driver impairing his own driving capabilities.

25 Referring now to Fig. 6, regarding an alternative version of circuit 20, the device 2 according to the invention can perform two additional actions, namely, switching on the right and left turn signals. As a matter of fact, it is sufficient to include a six-way relay 36 whose inputs N are connected to contacts 16 and 17, whose outputs C are connected to wires 22 and 23 and whose outputs O are connected to wires 38 and 39 that both lead to a turn signal circuit 40, respectively, for the turn

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signal to the right DX and to the left SX. The turn signal circuit 40 is also connected, via a wire 41 to coil 36a of relay 36, under positive voltage 42. Furthermore, wire 41 is connected, via a button 43, for example a switch, to the vehicle's electric ground. Relay 36 should be of a time-delay type, with a delay time to disconnection of, for example, 0.3 - 0.6 seconds.

Thus, by acting on switch 43, located for example next to grip 5 of device 2 so that it may be pressed for example with the left hand thumb, both contacts 16 and 17 are caused to switch from position N-C to position N-O of relay 36. If the driver, at the same time or with a 0.3 - 0.6 second delay, rotates grip 5, he will switch on the right turn signal DX or the left turn signal SX, depending if electrode 15 comes in touch with contact 16 or 17. After this fraction of time, relay 36 goes back to its initial position N-C, allowing the driver with a further rotation of grip 5, to honk or to turn on the normal beams or to switch from high to normal beams as described above. A further pressure on switch 43 causes the turn signal that had been turned on, to be turned off.

Referring to Fig. 7, a pair of devices 2a and 2b according to the present invention can be assembled on a steering gear 45 of vehicles of different types such as cars, trucks, motorboats, campers, and so on. By rotating grips 5a and 5b into one of their active positions and therefore bringing electrode 15 in touch with contact 16 or 17, it is possible to perform different functions, including honking the horn and turning on the headlights, as well as many others controls that are comfortable to execute while driving without the need to detach the hands from the steering wheel to make the drive unsafe. Grips 5a and 5b are, advantageously, covered with soft material and they do not hinder steering wheel rotation when curving.

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In the above only contacts 16 and 17 located inside grip 5 are mentioned; however, it is also possible to include into the design external contacts as shown in Figs. 8, 9 and 10. In fact, grip 5 can include a disk 46 fitted in a flange 47 made of insulating material and separated in two halves. A sphere 11 with spring 12 sets the grip intermediate position between the two extreme positions, where electrode 15, by means of a small conducting plate 48 fitted into disk 46, touches contacts 16 and 17 located inside flange 47. This solution, which is perfectly equivalent to the ones described above, has the advantage of being less expensive to construct.

It must also be noticed that both versions of circuit 20 of Figs. 5 and 6 and the simple one just described above but not shown, can be included into a compact electric or electronic device to be produced and made available on the market. The advantage in this is that it could be located far away from the steering gear, in particular in a safe and protected position, such as for example under the motorbike seat. A further advantage, for safety reasons and in order to obtain a better control from the electrical point of view, is then obtained, namely, contacts 16 and 17 carry only very weak currents, for example of the order of 50 - 100 m Ampere, instead of the 5 - 6 Ampere that standard motorbike switches usually carry.

Therefore, the device according to the present invention leads not only to a more practical way to operate the controls, as described above, but also to a simplification of the electrical system of the vehicle in the steering gear area, with the appreciable advantage already mentioned that wires 22 and 23, being the only two wires going from device 2 toward circuit 20, carry very weak currents.

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Variations and/or modifications can be brought to the device for the execution of controls on a vehicle according to the present invention, without departing from the scope of the invention itself as defined in the
5 appended claims.

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CLAIMS

1. Device for the execution of controls on a vehicle, characterized by the fact that it comprises a handle grip (5) pivotally connected to a portion of the steering gear, said handle grip having driving functionality and being able to assume a first and a second operative position with respect to the steering gear itself to which correspond respectively a first and a second electric control.

2. Device according to claim 1, wherein said first and second electric control are of impulsive type.

3. Device according to claims 1 and 2, wherein said grip comprises internally an electrode (15) electrically connected to the vehicle electric ground (14), in said first and second positions said electrode coming respectively into touch electrically with a first electric contact (16) corresponding to said first control and with a second electric contact (17) corresponding to said second control.

4. Device according to claim 3, wherein said second contact (17) is connected to the horn of the vehicle.

5. Device according to claim 3, wherein said first contact (16) is connected to a switch between the high and normal beams for the headlights of the vehicle.

6. Device according to claim 3, wherein said second electrical contact (17) is connected to the starting motor.

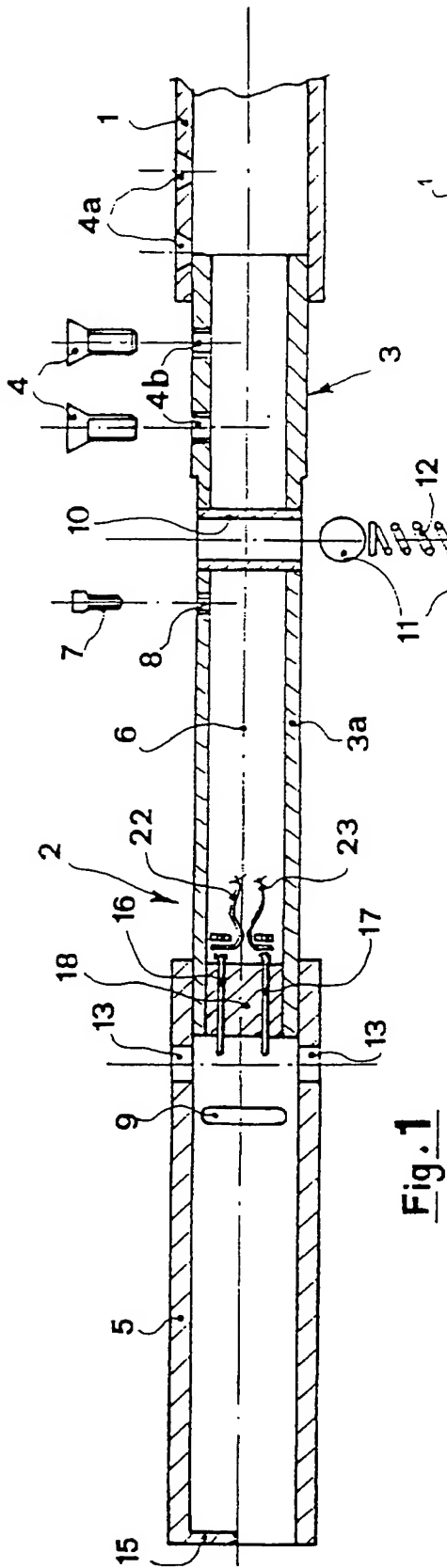
7. Device according to claim 3, wherein said first and second electrical contacts (16, 17) are connected to a circuit for switching on the turn signals.

8. Device according to claim 3, wherein said electrical contacts are connected to an electric circuit (20) for executing said first and second controls, said first control being one of the turn signals of the

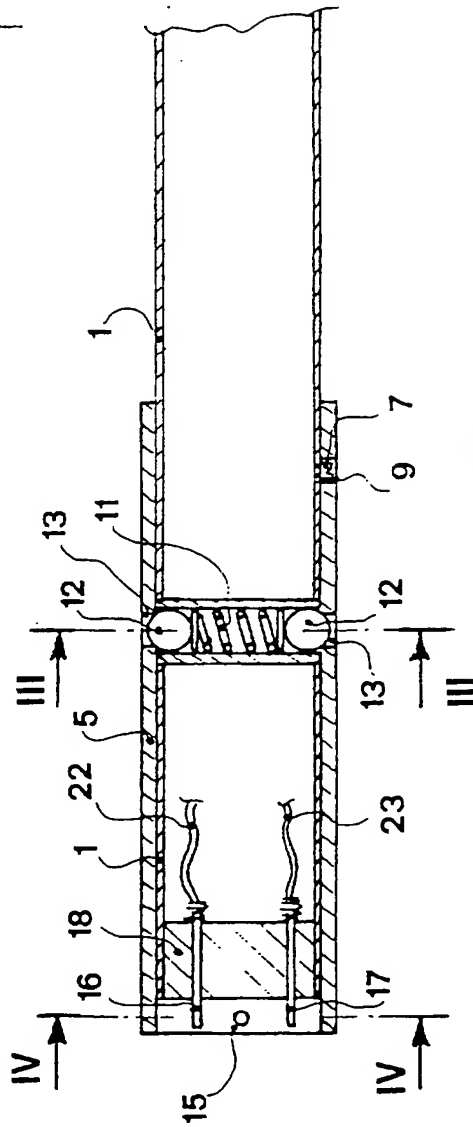
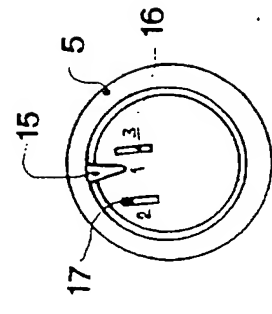
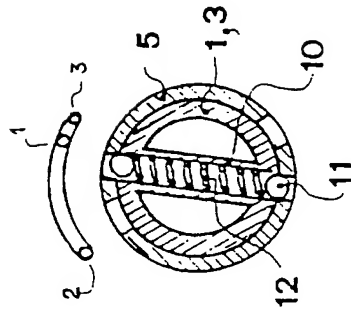
- 13 -

vehicle, the starting of the vehicle, the horn; to said second control corresponding the other turning signal of the vehicle, the switch from high to normal beams for the headlight and vice versa, the switch for flashing the high
5 or normal beams of the headlights.

9. Device according to the previous claims, wherein said steering gear (45) is of wheel type and two grips (5a, 5b) are included into the design, rotating on the steering wheel itself in order to bring said electrode in
10 touch with said contacts in said first or second control positions.



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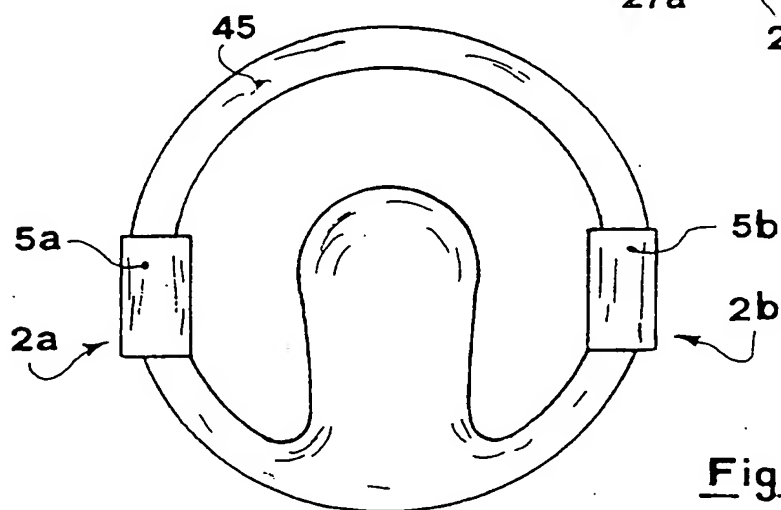
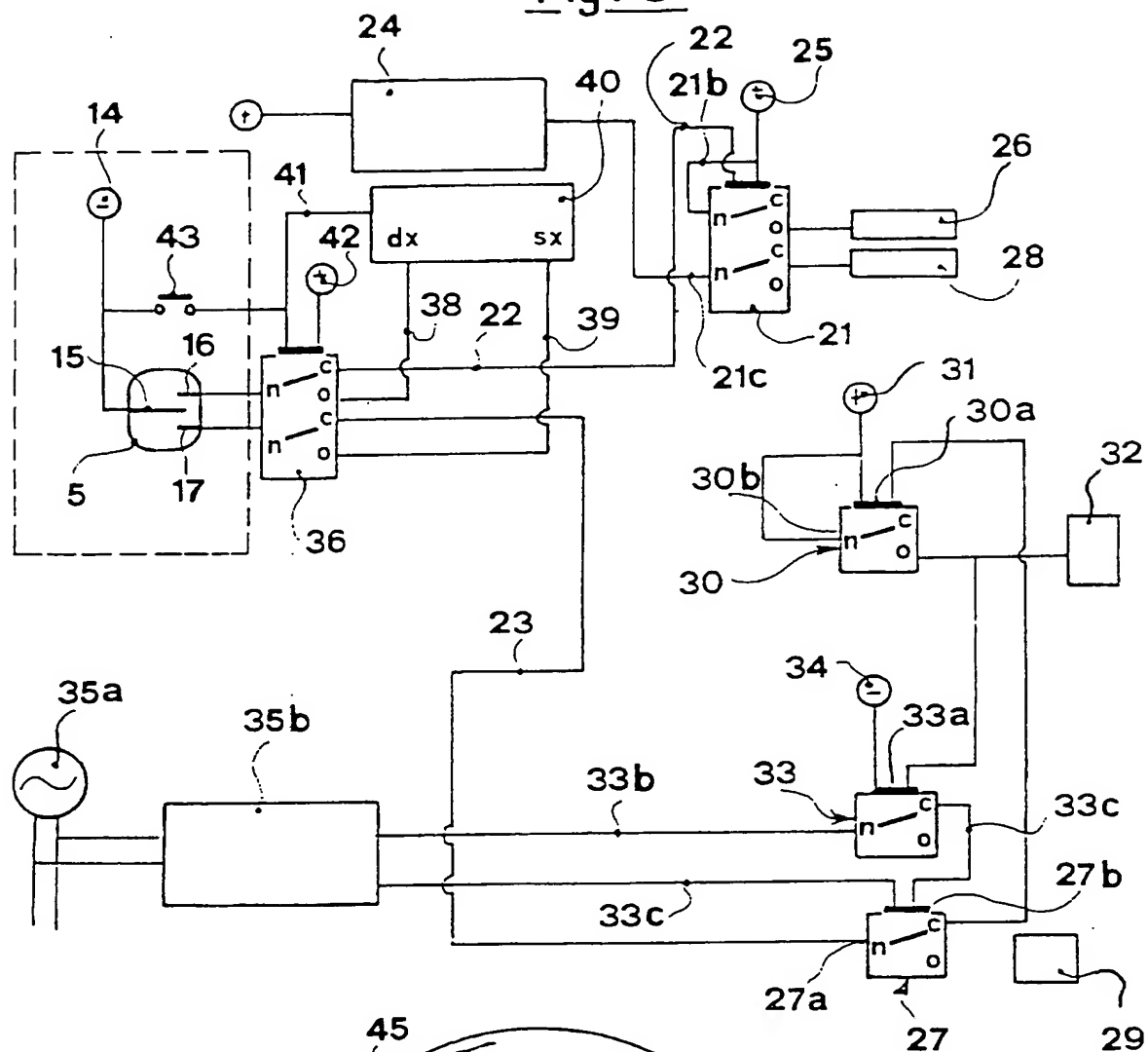
Fig. 6Fig. 7

Fig. 5

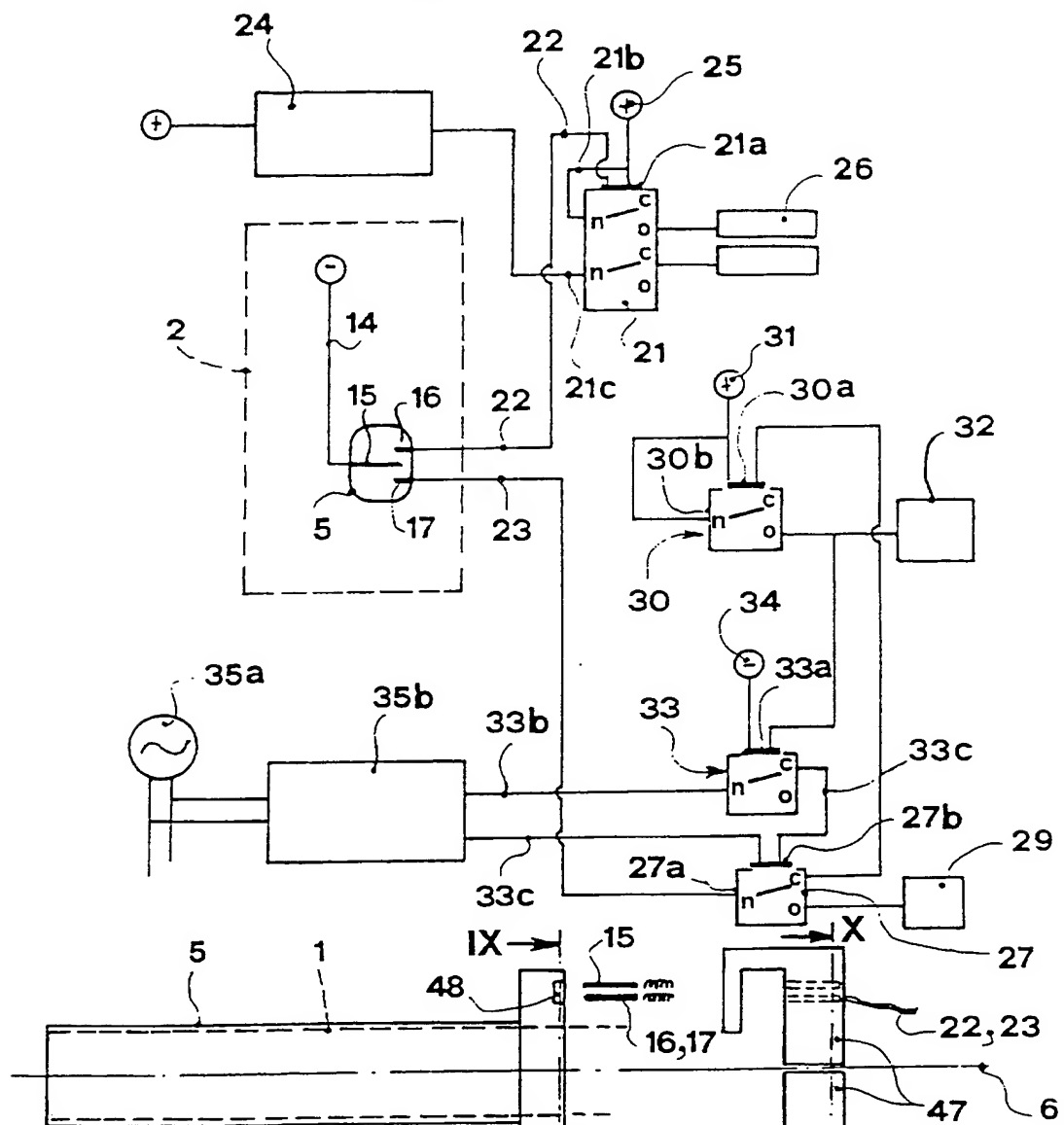


Fig. 8

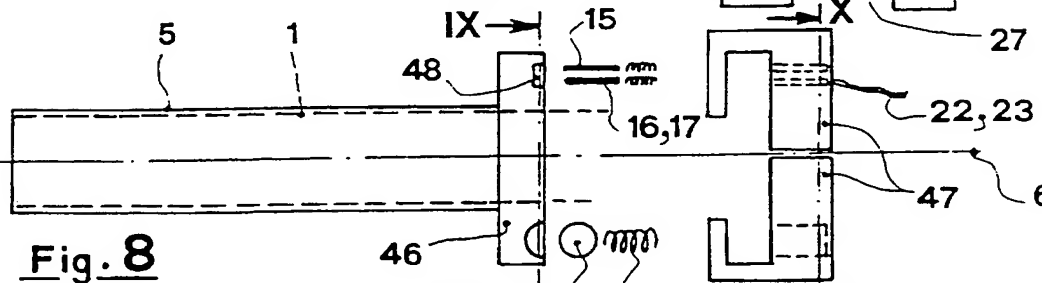


Fig. 9

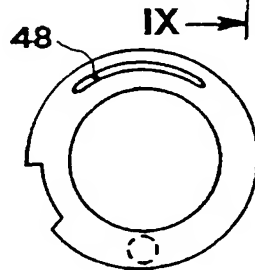
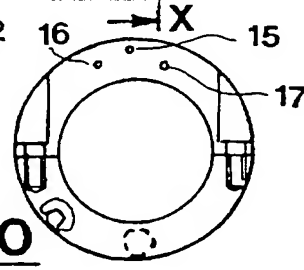


Fig.10



INTERNATIONAL SEARCH REPORT

Internat'l Application No
PCT/IT 97/00028

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B60R16/00 B62K11/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B60R B62K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2 793 262 A (ALBERT) 21 May 1957 see column 1, line 57 - line 39; figures 1,3,6,7,9,13 see column 3, line 43 - column 4, line 6 ---	1,2,9 3-8
X	US 1 683 852 A (WIEGNER ET AL.) 11 September 1928 see claims; figures ---	1,9
X	US 1 608 549 A (DEAN) 30 November 1926 see the whole document ---	1,9
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Date of the actual completion of the international search

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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Information on patent family members

Intern. Appl. No.

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